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ABSTRACT

Patterns of problem-solving activity in one middle-class urban high school are examined and a problem solving model rooted in a conceptual framework of contingency theory is presented. Contingency theory stresses that as political, economic, and social conditions in an organization's environment become problematic, the internal structures of the organization must be modified to meet the changing demands. In the case analysis, schools are viewed as networks of interlacing cycles of events dependent upon student and teacher behavioral cycles and upon environmental needs. Researchers, who acted as participant observers, gathered data over six months. They cooperated with school staff in a participatory way, yet were also impartial, confidential onlookers and questioners. The contingency theory model identifies problem solving as a cyclical process with the following seven key stages: problem recognition, problem screening, problem distribution, decision making, decision implementation, feedback, and problem resolution. Findings of this study indicate that problem solving at high schools can be identified as a cyclical process with several key stages. At each stage forces converge on the problem which determine the course of events leading to the subsequent stage and finally lead to the ultimate resolution of the problem. The conclusion is that a similar cyclical process with similar stages would be found in other schools if a contingency theory perspective was used. Ten propositions on problem solving are offered for further testing in other settings. (Author/DB)

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A CONTINGENCY VIEW OF PROBLEM SOLVING IN SCHOOLS: A CASE ANALYSIS

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A Contingency View of Problem Solving in Schools:

A Case Analysis

In a sense behavior, like beauty, is in the eye of the beholder. The analysis we give to a particular phenomena depends upon which foggy window of the black box we choose to peer through. Most writers and practitioners have tended to think and write about the school in the context of bureaucratic theory, with its emphasis on the formal hierarchy, centralized control, rationality, rule elaboration, division of labor, and the chain of command.[1] Other writers and practitioners tend to think and write about the schools through the perspective of socio-politcal group theory, with its emphasis on semi-autonomous, informal social systems which operate in an organizational power environment.[2]

A growing number of writers are trying to understand the operations of the schools through the perspective of contingency theory[3] which is a derivative of the open system theory.[4] A distinctive feature of open system theory is the focus on the dependency relationships and exchanges between the organization and its external environment. Schools are supported by and in turn must support the social, political and cultural demands of the community. As an open system, the school is seen as an (a) input (e.g., human, material, constraints, expectations), (b) through put (e.g., teaching-learning, reward systems, socialization), (c) output (e.g., graduates, custodial control, behavioral changes, romantic attachments), and (d) feedback and renewal process (e.g., information guiding decision-making, financial support to renew the cycle).

Contingency theory, on the other hand, concentrates its analytical focus on the adjustments internal to the organization as it seeks to modify procedures to meet the changing demands of the open system. Thus, the contingency perspective stresses that the school requires variability in organizational response capabilities to cope with changing environmental needs and demands.

In addition, as Emery and Trist[5] point out, organizational environments range from placid to turbulent in character. A turbulent environment reflects changing conditions outside and/or inside the organization which results in increased levels of tension on the management process. With the rise in tension on one of the many front lines of the organization, some type of response is called for. In other words, when the environment becomes turbulent, problems for the organization emerge which need to be solved.

As an illustration of contingency theory, when an armed terrorist leaps to his feet on a routine commercial flight and demands that the craft be flown to Syria (open system theory), the pilot and his crew must shift their thoughts and actions into one of several contingency plans available (contingency theory). For example, depending on their assessment of the situation, (a) they can ignore the gunman entirely and proceed toward their established destination, (b) they can attempt to overpower the terrorist during an unguarded moment, (c) they can try and talk the gunman out of his intentions, (d) they can feign mechanical problems and descend toward the nearest airport, or (e) they can argue that they have neither the fuel nor the maps for such a trip and that the craft must land to acquire the necessary provisions. Once on the ground the crew hopes that those monitoring events from below will have contingency plans of their own to manage the situation safely and successfully.

In the educational context, if demographic shifts take place in a school district, there could be a significant impact on the support and expectations placed on the schools (open system theory). The curricular and counseling programs internal to the school may need to be modified in one of several possible directions to adjust to the new environmental conditions (contingency theory). For example, (a) there may be a need for more courses dealing with multi-cultural understandings, (b) counseling efforts may emphasize a vocational programing schedule for students rather than a college preparatory course of study, or

(c) discipline procedures may be altered depending on parental expectations and campus security requirements.

In responding to environmental demands, the organization is influenced by various constraints (e.g., budget, employee relations, policies, political considerations). These constraints also act as contingencies which affect problem-solving. Thus, simultaneously, contingency theory emphasizes the flexibility and adaptability of open systems decisional management but also the constraints imposed on the problem-solving process which limit alternatives.

The examples of the terrorist and the demographic shift demonstrate that contingency theory emphasizes adaptability and change. Standard patterns of organization and administration are not appropriate in the face of all types of environmental demands and needs. There is no one best way for designing organizations, jobs, authority patterns, tasks; it all depends on the particular circumstances in a specific situation. Since the environmental milieu is open, unpredictable, and innovative, standardization and stability are replaced by more differentiation and flexibility.

Research Design

In conducting this study we decided upon the following interlaced objectives:

A) To diagnose how the problem solving process in a school functions (not how it should function but how it does function).

B) To diagnose how the problem solving process in a school functions as analyzed through an open systems/contingency theory conceptual framework.

Hence, we set out to treat two interwoven targets: refining our insight into how problems are solved in schools and calibrating a conceptual framework so that it becomes a more precise tool for understanding how the problem solving process works.

This study took place in a comprehensive high school, referred to as Elmwood High, located in a middle income neighborhood of a large city in the Western part

part of the United States. Using Robert Havighurst's[6] classification of high status schools, main-line schools, common-man schools, and inner-city schools, Elmwood High would be classified subjectively as a "main-line." A second "main-line" school was also studied on a more limited basis to "check" the conclusions drawn from Elmwood thus reducing the likelihood that idiosyncratic patterns peculiar to a single setting were being identified. Hence, a lead school -- check school pattern became the dominant mode of investigation.

Data were gathered using an "observer as a participant" technique[7] in which the authors could view natural situations as members of the social system who cooperated with staff in a participatory way yet were also identified as impartial, confidential onlookers and questioners who could inquire about matters not usually discussed among peers and colleagues.[8]

In this role, the researchers were able to spend six months examining both the informal and formal subsystems of the problem-solving process. In this study, problems and the problem-solving process are identified as they are perceived by the researchers rather than by any single group of participants such as parents, teachers or administrators.

In the first instance, informal interviews of varying lengths were conducted with a non-restricted sample of teachers and administrators concerning all academic programs and administrative areas. Eighty percent of the total population of teachers at Elmwood (N = 96) and sixty-five percent of the teachers at the "check" school (N = 77) participated in the informal interview phase while one hundred percent of the population of administrators (N = 5 at each school) were questioned. In depth, forty-five to sixty minute formal interviews were conducted with all those teachers and administrators identified by the researchers as informal and/or formal leaders. Document analysis (e.g., teachers' handbooks, district policy guidelines, minutes of meetings) and direct observation (e.g., teacher conferences, faculty lounge, administrative meetings, classroom sessions) were also integral components of the research design.

Joseph McGrath[9] identifies the hierarchical ordering of research methodologies with reference to control over variables as: (a) field studies, (b) experimental studies emphasizing hypothesis testing, and (c) laboratory experiments. As a field study the research design used here is exploratory and hence, according to Richard Scott,[10] ". . . is one in which the primary purpose is to gain familiarity with some problem or to achieve new insights which can guide future research." At Elmwood High we examined a series of events with the end objective of capturing an understanding of the patterned processes that existed in the normal life of that organization.[11]

In order to set the stage for this study, a brief discussion of the analytical framework is in order.

A Few Key Concepts

The beauty of open system theory is that it nicely incorporates the sound and valuable characteristics of bureaucratic theory and social systems theory while setting aside their natural tendencies toward closed system and static properties. A static state is similar to a still photograph in which the properties are fixed (stable) in their relationships and set apart (closed) from their surrounding environment. A dynamic state, on the other hand, can be conceptualized as a motion picture in which the properties are in constant action over time. Allport[12] untangled the knotty problem of switching from a static perspective of organizational structure (e.g., the line and staff chart) to a "moving" perspective by visualizing structure in an organization as being composed of reoccurring cycles of events.

An organization is structured (held together, if you will) by networks of major and minor cycles of events which are interdependent and reinforcing. At Elmwood High, for example, a major cycle can be seen in the patterned events of an academic year: students enroll in the fall, the teaching-learning process is

engaged, examinations are given, grades are noted, credits are accumulated, and finally students are promoted or they are graduated. Then the cycle begins anew with the next fall term.

During this yearly cycle a multitude of minor support cycles for students, teachers, administrators, courses, classrooms, departments and the like are interwoven into major yearly cycles. These internal major and minor cycles link together to make up the entire structure of the school. School structure is also influenced by major cycles outside the school which include school board elections, legislative activity, and economic trends.

Elements of bureaucratic theory and social system theory play valuable roles in defining the basic characteristics of behavioral cycles. Formal goals, roles, rules, etc., of bureaucratic theory and the informal goals, vested interests, norms, etc., of social system theory are now seen as constraints (contingencies) which shape the patterning of events which make up each cycle. For example, the formal rules tell teachers such things as when to arrive at Elmwood High, when to stand in the hall and monitor student movement, and when to go home. The informal social system norms tell the teacher such things as when she <u>really</u> has to arrive on campus, how to trade duties with other teachers, and when it is safe to go home early. The cycles change when the contingencies which make them up change.

Another consideration in describing schools is the acknowledgement that problem solving for schools takes place in an atmosphere which must incorporate simultaneously bureaucratic needs for a rational, predictable, controlled and efficient environment along with "professional" needs for an autonomous, spontaneous, creative, and flexible environment. To differing degrees a specific category of organization such as universities, hospitals, research institutes, and schools face this unique issue of problem solving in the context of cadre of professionals working in a formal organizational setting.[13]

Viewing schools as a network of interlacing cycles of events allows one to conceptualize a problem-solving cycle which is contingent on environmental needs and demands and sensitive to the constraints (contingencies) imposed by major and minor behavioral cycles. The next section will describe the problem-solving cycle as it was seen at Elmwood High.

The Problem Solving Cycle

As an overview of the findings, seven key stages were identified in the problem-solving cycle at Elmwood High (see Figure 1).

Insert Figure 1 about here

The basic stages in the process were identified as follows:

1. Problem recognition stage
2. Problem screening stage
3. Problem distribution stage
4. Decision-making stage
5. Decision implementation stage
6. Feedback stage
7. Problem resolution or renewal stage

A problem emerges as a growing tension somewhere inside or on the boundary of the school. In the problem recognition stage, the environment is identified as turbulent, or potentially so, and the organization attempts to buffer (screen) itself from decisional activity if possible. The next stage is activated when buffering attempts fail or are voluntarily suspended. A decision must now be made. Therefore, the following step deals with decisional management, and a key feature is the distribution of decisional responsibility to one of several centers of power (formal or informal) which form the basis of decisional jurisdictions in the school. The decisional jurisdiction maintained by teachers and that maintained by administrators is contingent on a number of organizational factors which will be examined later.

An outcome of the problem-solving activity by teachers and/or administrators is a decision. However, making decisions and carrying them out are two different processes and the final results do not always match the initial expectations or intentions.

The next stage surrounds the feedback process. If the actions taken in the decision-making and implementation stages neutralize or sufficiently reduce the tension to acceptable levels, the cycle terminates and the problem is considered solved. The school then redirects its energy to other problems. However, if the level of tension remains high due to such things as unanticipated consequences of the decision or improper implementation, then the problem-solving cycle begins anew.

Now that the basic stages of the problem-solving cycle have been outlined as they were identified at Elmwood High, the various components and contingencies that shaped them will be discussed. The first research question was, what is the nature of events that initiate the problem-solving process?

Problem Recognition

Within the context of a tension management model, an issue becomes a problem to be treated when it surpasses some ill-defined tolerance levels built in the organization -- not unlike that point when an individual makes a choice to take an aspirin to treat a growing headache. Emery and Trust[14] illustrate this condition as the organizational environment moving from placid to turbulent. At Elmwood High the school personnel (administrators and/or teachers) usually found themselves at the beginning stages of the problem-solving process when they encountered an expectation (in a range from weak to strong) that something in the school needed to be changed (dropped, added, modified). Recognition expressions continually emerged in the interview sessions, such as, "it hit the fan," or "parents kept coming in here and complaining," or "the higher ups deemed it necessary," or "they kept sticking their noses in."

The data patterns reveal that the tension was generated from both external (e.g., parents, central office, teachers' association) and internal (e.g., students, teachers, administrators) sources. The school personnel were acutely aware that life could be made miserable if any one of these groups got upset because each saw itself as a legitimate stockholder in the school. Because participants in the life of the school had their own investments ("I've taught here for twelve years,"/"I know my field"), and vested interests ("we need smaller classes,"/"our salaries are not high enough,"/"we need more resources"), and because conflicting opinions always existed about "what needs to be changed around here," Elmwood High was never found wanting for problems to solve. However, as the next section points out, an organizational buffer acting as a screening device first had to be penetrated before problem-solving energy would be expended. The next question to address, therefore, was how does the organization screen out problems it does not care to treat?

The Organizational Buffer

Buffering out (screening) tension was not an accidental or haphazard activity, but a conscious effort on the part of both administrators and teachers to be selective in the number and kind of issues which activated the problem-solving cycle. To do otherwise would have choked the school with an overload of petty, impractical, at times improper, and frequently impossible petitions for change. The buffer acting as an operational screening device, revealed itself in five basic strategies used by school personnel when confronting an environmental tension demanding attention.

Buffer #1, No Jurisdiction: The administrators of the school tended to serve as the lightning rod on issues of complaint. One strategy frequently observed at Elmwood High was to disclaim any authority to act; a "there is nothing I can do" posture. A parent calls to complain about students smoking pot in a house

across the street; "that is really a police matter." A parent is upset over a low grade given in a course; "grades are legally not within my power to change." A teacher worries about a student who is having family problems; "that is out of my realm of authority." Teachers would often deflect petitions with, "you should go see the principal."

Buffer #2, Strategic Catharsis: A second strategy is to allow the complainer to "talk it out." This tactic, as the principal explained, is to "make (parents) feel better and restore (their) confidence in the schooling process." If complainers are given a way of "letting off steam" their problem often seems smaller and they do not pursue them.

Buffer #3, Strategic Stalling: A third strategy results from consciously or unconsciously assigning a problem such a low priority that it never gets acted upon and, as numerous teachers put it, "dies a natural death." Issues can also be sent to a committee for study and never be heard from again, or a decision to act can be made and then crumble in an atmosphere of "you do it -- no, you do it," and then no one does it.

Buffer #4, Strategic Ignoring: Some issues are better off to "just let them lie," many of the school personnel pointed out. The expectation is that the problem will go away. Also, to call attention to an issue, such as specific teachers not properly using homeroom period for counseling or leaving the campus too early, can frequently cause more and even greater problems.

Buffer #5, Mutual Reinforcement: Within Elmwood High there are norms which work as protective shields behind which the thrust of a challenge can be thwarted. Administrators, for example, are expected to back up their teachers, particularly in areas of instructional and curricular management. Parental challenges, such as, "Mrs. X has obviously shown she cannot handle that class" or "and we all know the lack of really superior teachers in that department" are met with administrative reassurance of the professional competence of the staff. Also, certain decisions

with respect to budget were reserved for teachers and administrators with little input by parents.

Teachers, too, were protective of the professional rights of fellow teachers. Rarely did we record statements in which teachers openly criticized the professional performance of colleagues.

In short, buffering is a combination of techniques used by teachers and administrators which serve a gate keeping function in the problem-solving process. From an organizational point of view, initiating some form of screening process is a necessary practice. However, the buffer is often removed willingly by school personnel when they wish to treat a specific problem. The buffer can also be penetrated forcefully by internal and external pressures, requiring school personnel to tackle a problem which they would rather overlook. The research question becomes, under what conditions is the buffer penetrated?

Penetrating the Buffer

After analyzing the data, the researchers identified five major patterns through which the buffering devices tended to prove ineffective.

(a) Intermittent Renewal Pattern: Sometimes the tension surrounding an issue would refuse to die and repeatedly rise up seeking yet another hearing. Elmwood teachers, for example, waged a continuous, low keyed struggle with administrators to attain more significant participation in such issues as the selection of department chairmen, registration procedures, class size, course adoptions, and budget allocations.

(b) Crisis Management: Crisis conditions generated from inside or outside the school, such as a racial conflict or a group of parents or teachers going to the school board, would immediately penetrate the screening device. As one teacher suggested, "teachers or irate parents, at times, can make an awful lot of noise if the issue is important enough. It's hard for administrators to ignore us."

(c) Central Office Directives: Although the school personnel frequently screened out "suggestions" made by the central office personnel, when directives arrived backed by school board policy or state law, the buffer was quickly breached. Also, parental requests obtaining sanction from central office officials generally triggered problem-solving activity.

(d) Identifying the Soft Spot Pattern: The buffer surrounding school decision-making was not equally impermeable at all points. At times a group wishing to achieve some form of change in the school would appeal to one group after another until it could obtain a favorable hearing and acquire a strong sponsor. A group of students, for example, who wanted a course offered in Cultures of the Orient found a deaf ear when they approached some teachers but later obtained an ally in the administrator who then successfully argued their case.

(e) Voluntary Removal of the Buffer: The teachers and/or administrators oftentimes decided voluntarily to take on and solve a problem because it appeared to be in the best interests of the school. The organizational climate at Elmwood High School appeared to be quite healthy as indicated by a willingness to respond frequently to the need for change.

Following the penetration of the buffer, the complex process of making a decision began. The next question became, how is the problem-solving process managed in the power environment of the school?

Decisional Management

The model depicted in Figure 1 illustrates that after penetrating the buffer, decision-making activity occurs as a single problem-solving cycle or reoccurs in multiple cycles until the environmental tension is reduced to tolerable levels and the problem is considered solved. Typically, one of three possible cyclical patterns was initiated when the problem-solving process was triggered. Within each pattern the decision-making responsibility was assumed by a center of power which, in turn, made a decision designed to promote problem resolution.

Distribution to Independent Power Centers

The most clearly identifiable cycle of decision-making occurred when a problem fell within one of the generally understood and accepted "spheres of influence,"[15] "decisional jurisdictions,"[16] or "decisional zones,"[17] as they have been referred to in the literature. (Here these three will be used interchangeably.) At Elmwood High School the administrators held jurisdiction over certain types of issues while teachers held jurisdiction over others. The existence of these semi-autonomous spheres of influence made it possible for the school to support simultaneously two very dissimilar decisional environments essential in the educational organization: a rational, formal, programmed environment for the bureaucratic needs of the organization and a more creative, flexible, informal environment for instructional demands.

The teachers and administrators were quite clear about the limits of their own sphere of influence. Regarding specific types of problem issues, the interview data revealed consistency about "how we do things around here," and "there are few surprises." Individual teachers, for example, have a high degree of discretion and control over their classroom teaching-learning environment, instructional assignments, content of the curriculum, student evaluations, and in-class discipline.

Administrators, on the other hand, are clearly zoned control over campus discipline, relations with external centers of power, classified employment, budget control over fixed cost items, probationary teacher evaluation, and controversial curricular items. Our observations are not inconsistent with Dan Lortie's[18] when he observes that the teacher's immersion in teaching tasks and her relative indifference to school-wide organizational affairs sets the basis for decisional zoning. It is significant to note that the zoning process plays an important role in laying the basis of predictability between teachers and administrators and therefore functions as a conflict reduction mechanism.

At Elmwood High the administrators and teachers placed limits on intrusions of the other into their perceived domain. For example, speaking for many of the same mind, one educator explained that teachers get very "uptight over extremely large class loads and will usually make life miserable for the principal if it happens." The principal, in this case, knows that he had reached his limit; not legally, but as far as compatible working relationships allow.

In short, after a problem has penetrated the buffer, it may fall within one of the accepted decisional jurisdictions of either teachers or administrators. The decision-making authority of Elmwood teachers and administrators was confined, then, by formal and informal norms and traditions which stipulated which individuals would treat which problem issues the first time they surface as a point of tension.

Distribution to Collective Power Centers

Within each sphere of influence there were also collective (group) centers of power. Groups as opposed to individuals took on the decision as it fell within their jurisdiction. Teacher groups (e.g., curriculum council, departmental committees), for example, handled departmental testing, book selections (within a state approved list), and departmental supplies with rare interference from administrators, district officials, or parents.

Administrator groups decided on suspensions, student activity restrictions, many budgeting matters, and most campus regulations. This pattern usually involved formally constituted groups within the school as well as participation on the part of external centers of power such as those represented by the parent advisory committee and other community groups.

Distribution to "Contested" Power Centers

As Figure 1 illustrates, at Elmwood High there was an area of overlap between the spheres of influence where clear hegemony to decide issues was unclear, thus

creating a condition of "contested jurisdiction."[19] Within this "contested sphere" administrators and teachers at times shared the responsibility and work, but at times they competed for decisional advantage through the use of numerous stratagems.

For example, administrators at times maneuvered for an upper hand through their control of scarce resources, such as funds for extra supplies or financial support to attend a conference. Teachers also used various stratagems to gain decisional advantage. Some of these included padding budget requests, forming coalitions to back a direct confrontation, appealing to their own expertise as the most knowledgeable on the issue, or threatening to call in the teachers' association.

In examining the data focusing on this contested jurisdiction, the researchers discovered that there were few formal rules giving it structure. Such rules would have had an impact on the classroom environment which everyone usually tried to avoid. The chief means of establishing a degree of understanding, direction, and order in this contested zone was through agreements based on informal negotiations.

An informal negotiation points toward attaining an agreement between administrators and teachers (oftentimes central office officials, parents and students as well) on how a particular problem should be handled. The researchers observed school personnel negotiating in groups of all sizes (e.g., one-on-one, small groups, large assemblies), in all corners of the campus (e.g., classrooms, principal's office, tennis courts, faculty lounge), at all times of the day.

Negotiations covered the full range of problems that fall within the contested zone, some of which were trivial and others compelling. For example, teachers negotiated with administrators for more discretion in ordering instructional materials, obtaining different room assignments, or securing new committee appointments; administrators negotiated with teachers for increased vigilance in the halls; administrators and teachers negotiated with parents for increased

participation in school affairs or more patience and understanding with school academic programs.

Within the relatively unique professional/bureaucratic environmental mix of the school, giving direct orders (e.g., administrator to teacher, parent to administrator) was not at all appropriate. Instead, the on-going negotiation process served to bridge the gap between tne two environments with the result of determining what was to be done, when it was to be done, and who was to do it. In other words, the vast network of negotiations continually going on brought an acceptable degree of order and stability to a contested zone and thus facilitated the task of "getting through the day."

Somewhat parallel to the management problem found in the school setting is the hospital setting which also maintains a contested zone between the administrators and the professionals. On this subject Strauss, et. al.,[20] write:

> The hospital can be visualized as a place where numerous agreements are continually being terminated or forgotten, but also as continually being established, renewed, reviewed, revoked, revised. Hence, at any moment those that are in effect are considerably different from those that were or will be.

In a similar manner, at Elmwood High the uncertainties of decisional control were only temporarily abated through informal, interpersonal negotiations since the unpredictable nature of this domain compelled teachers and administrators to constantly shift their energies to other problems and conflicts. Hence, as problems would arise a network of informal negotiations would be spun around them until an acceptable agreement on what to do emerged. The next time a similar problem arose, a different solution would often be negotiated.

Whether or not a second or even third or fourth cycle is called for is dependent on the implementation and outcome of the negotiated decision which emerges from the contested zone.

Implementation and Feedback

After decision-making responsibility is distributed to a center of power and a decision is made, the implementation stage is initiated. More often than not the successive stages illustrated in Figure 1, including implementation, would be navigated safely by the educators at Elmwood High and the problem would sink from sight. That is, after a decision on what to do emerged, the implementation would take place and the outcome would become known to interested parties. If feedback was positive or if no feedback at all came in, the tension initiating the cycle had been neutralized and the problem solved.

However, at times the swift and speedy dispatch of problems through a single cycle was not at all easy. At Elmwood High we observed that making a decision and carrying it out were two altogether different processes. Lack of information, time, interest, and resources often made the latter immeasurably more difficult than the former. As a result, the end product of a decision often had only the vaguest resemblance to the decision itself. Baldridge[21] comments on this difficulty:

> We have said that the concept of 'decision-making' is a delusion. Decisions are not really made; instead, they come unstuck, are reversed, get unmade during the execution, or lose their impact as powerful political groups fight them. In real life decisions go round and round in circles, and the best one can hope for in the political battle is a temporary win.

As a consequence of the lack of fidelity between the decision and the implementation of that decision, the consequences (often unaticipated) sometimes did little to reduce the tension which was the source of the problem in the first place. At times minority group students, parents, or teachers were quick to register their protest at what was being offered as a solution to their problem. Often they liked neither the decision nor the execution. At times they liked the decision but the implementation did not satisfy them. In any case, the problem did not go away.

As Figure 1 illustrates, when the tension that initiates a problem is not significantly diminished after the first run-through of the problem-solving cycle,

a second cycle is triggered. At Elmwood High a measure of the intensity of the continuing tension was whether or not it could penetrate the buffer a second (or a third or fourth) time. All problems had to re-penetrate the buffer during each additional cycle. At Elmwood High the problem distribution stage differed notably the second time due to the experience gained about why the school personnel did not succeed on the first attempt. At times the same individual or group would retain decisional jurisdiction, but this time after gathering much additional information. Typically, when a group was involved it would be reconstituted to include, in various combinations, a broader range of participants, specific representation from individuals or groups who represent dissident voices, a higher level of expertise, a more extensive involvement of opinion leaders or power brokers, and an elimination of disinterested parties.

Similar to the first cycle run-through, after the decision had been made, an implementation stage would take place followed by the feedback phase. Sometimes problems would cease to exist after the first or second cycles, but frequently many cycles were required. Thus, based on the specific decision and/or the implementation of that decision, positive or negative feedback flows back to the school from the source of the original tension (e.g., parents, central office, teachers, students, administrators). Positive feedback suggests that the tension has been neutralized or dissolved, but negative feedback informs the school personnel that an additional cycle of decision-making is advisable.

Concluding Comments

No argument is being made here that the decision-making model which emerged at Elmwood High could be transferred wholesale to another educational setting. Typically, an organizational model dealing with something like decision-making is made up of content elements (what is decided) and process elements (the way it is decided). Our argument is that a similar cyclical process with similar stages would be found in other high schools if an open system/contingency theory

perspective was used in the process of data gathering and analysis. In other words, researchers would find a single or multiple cyclical problem-solving process which incorporates the elements of a screening device, a power environment, spheres of influence, a contested zone, a negotiated order, an implementation stage, a feedback process, and an entire network of contingencies which help in determining what direction the decision may turn at any given stage.

In the final section of this paper a set of propositions are generated which were extracted from the study at Elmwood High School. These propositions are offered for further testing in other settings using other methodologies.

Propositions

The following propositions on problem solving emerged from the data of the study at Elmwood High School:

1. Major Proposition: The problem-solving process comes in the form of a cycle of events in which a solution is pursued that will re-establish an acceptable equilibrium with the environment.
2. Major Proposition: When tension emerges in the external or internal environment of a school, a problem-solving process will be initiated to eliminate that tension.
3. Major Proposition: An organization can respond only to a limited number of tensions emerging from the environment (external or internal), therefore, it will erect a buffering device to screen (e.g., reject, delay, prioritize) those issues which trigger the problem-solving process.
4. Major Proposition: Once a problem penetrates the organizational buffer and enters the power environment of the school, it will flow to a center of authority which has decisional jurisdiction over the specific issue presented.

4.1. Minor Proposition: When the problem concerns classroom related issues such as the organization of the teaching-learning environment, classroom working conditions, or departmental functioning, teacher centers of power will assume basic control over the issues.

4.2. Minor Proposition: When the problem concerns schoolwide issues such as the total school budget, conformance to legal standards, campus security, the school image as seen by significant others, or a balanced total school curriculum, then predominantly administrative centers of power will have significantly greater decision-making discretion and control than teachers.

5. Major Proposition: When a problem flows to an area of contested jurisdiction, an informal negotiation process will develop to arrive at a decision acceptable to the parties most directly involved.

5.1. Minor Proposition: The informal negotiation process between teachers and managers is necessary to establish a working bridge between the rational, programmed, standardized environment of administration and the creative, flexible, spontaneous environment of teaching-learning.

6. Major Proposition: When there are limited time commitments or restrictions which must be followed closely, the decisional activity is likely to be confined to specific, formally designated centers of power.

6.1. Minor Proposition: When managers encroach upon the domain of teachers, the teachers will resist the interventions through the application of informal defense mechanisms.

6.2. Minor Proposition: When teachers encroach upon the decision-making domain of managers, the managers will resist the interventions through the application of formal defense mechanisms.

7. Major Proposition: The greater the negative feedback resulting from the outcome of a decision, the greater the probability that a second cycle will be triggered.

8. Major Proposition: The more controversial a problem, the greater the probability that additional cycles will ensue.

9. Major Proposition: When the implementation of a decision is not faithful to the decision itself, the greater the probability that additional cycles will ensue.

10. Major Proposition: When additional problem-solving cycles are necessary, the center of power which makes the choice will expand to include representation among dissident parties, a higher level of expertise and information, and additional opinion leaders.

In short, this paper has attempted to give definition to the problem-solving process at Elmwood High School as a cycle of events. The cycle of events contains numerous stages where the problem can be deflected in any number of directions depending upon the various contingencies surrounding the situation. As such, the problem-solving process is often unpredictable. The lack of predictability is especially true for those types of problems which penetrate the buffer and fall in a "contested" decision-making jurisdiction. For those problems which fall in noncontested decision-making jurisdictions, the process of problem solving seems to be more predictable because fewer contingencies are present.

This portrayal of the problem-solving process differs considerably from that depicted in the bureaucratic or social system modesl which are used as conceptual frameworks so often in the education literature. Our belief is that continued investigation of problem solving using the open system and contingency theory models will give us an even clearer understanding of the operation of schools.

NOTES

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Figure 1

The Problem Solving Process